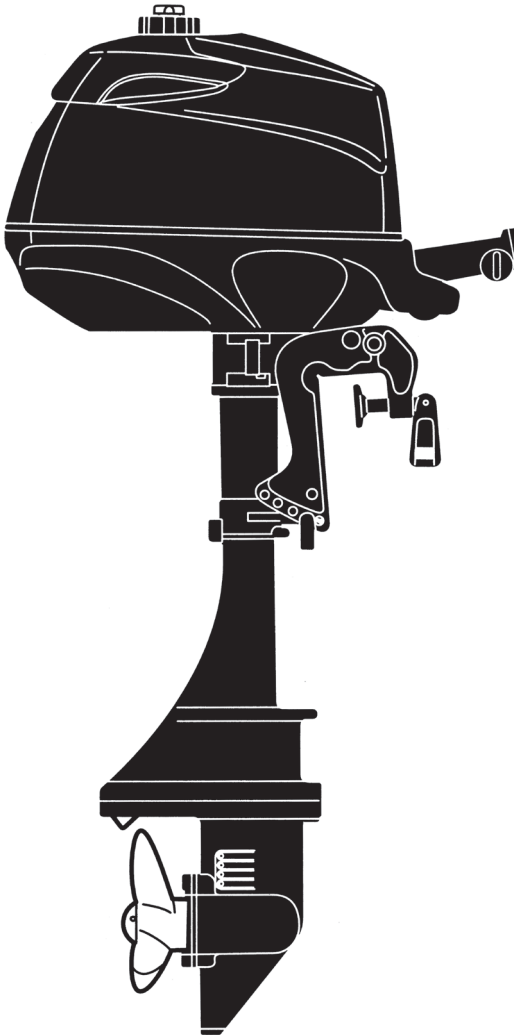


OWNER'S MANUAL



TOHATSU
Outboards

MFS 2.5B
3.5B

OB No.003-11085-6

⚠ READ THIS MANUAL BEFORE USING THE OUTBOARD MOTOR. FAILURE TO FOLLOW THE INSTRUCTIONS AND SAFETY PRECAUTIONS IN THIS MANUAL CAN RESULT IN SERIOUS INJURY OR DEATH. KEEP THIS MANUAL IN A SAFE LOCATION FOR FUTURE REFERENCE.

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YOUR TOHATSU OUTBOARD MOTOR

OWNER REGISTRATION AND IDENTIFICATION

Upon purchasing this product, be sure that the WARRANTY CARD is correctly and completely filled out and mailed to the addressee noted there on. This WARRANTY CARD identifies you as the legal owner of the product and serves as your warranty registration.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, YOUR OUTBOARD MOTOR WILL NOT BE COVERED BY THE APPLICABLE LIMITED WARRANTY, IF THIS PROCEDURE IS NOT FOLLOWED.

PRE-DELIVERY CHECK

Be sure that the product has been checked by an authorized TOHATSU dealer before you take delivery.

Limited Warranty

Please refer to the TOHATSU outboard motor Limited warranty provided to you with this product, the terms and conditions of which, as amended from time to time, are incorporated by reference into the manual.

Serial Number

In the space below, please record the outboard motor's serial number (indicated both on the lower motor cover and on the cylinder block). The serial number will be needed in the event of theft or to quickly identifying the outboard motor type.

Serial Number :

To You, Our Customer

Thank you for selecting a TOHATSU outboard motor. You are now the proud owner of an excellent outboard motor that will service you for many years to come.

This manual should be read in its entirety and the inspection and maintenance procedures described later in this manual should be followed carefully. Should a problem arise with the outboard motor, please follow the troubleshooting procedures listed at the end of this manual. If the problem persists, contact an authorized TOHATSU service shop or dealer.

We hope you will enjoy your outboard motor and wish you good luck in your boating adventures.

TOHATSU CORPORATION

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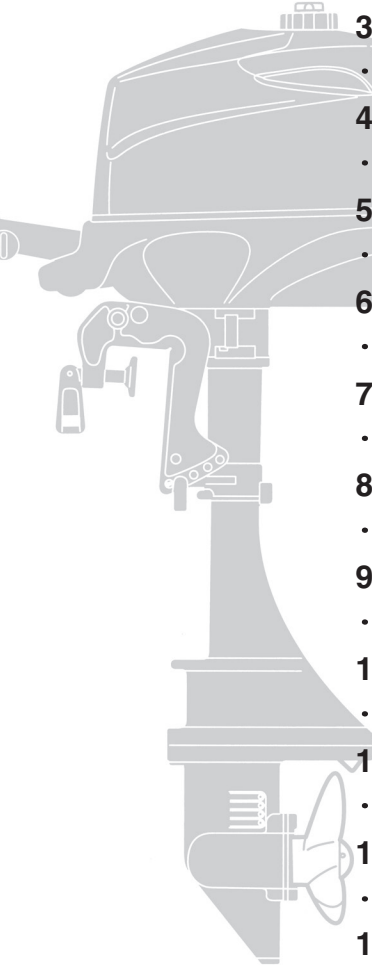
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GENERAL SAFETY INFORMATION

NOTICE : DANGER/WARNING/CAUTION/Note

Before installing, operating or otherwise handling your outboard motor, be sure to thoroughly read and understand this Owner's Manual and carefully follow all of the instructions. Of particular importance is information preceded by the words "DANGER," "WARNING," "CAUTION," and "Note." Always pay special attention to such information to ensure safe operation of the outboard motor at all times.

DANGER

Failure to observe will result in severe personal injury or death, and possibly property damage.

WARNING

Failure to observe could result in severe personal injury or death, or property damage.

CAUTION

Failure to observe could result in personal injury or property damage.

Note

This instruction provides special information to facilitate the use or maintenance of the outboard motor or to clarify important points.

EMERGENCY STOP SWITCH

The Emergency Stop Switch will stall the outboard motor when the stop switch tether is pulled off. This stop switch tether can be attached to the operator of the outboard motor to minimize or prevent injuries from the propeller in case the operator falls overboard.

We highly recommend use of the Emergency Stop Switch tether.

WARNING

Accidental activation of the Emergency Stop Switch (such as the tether being pulled out in heavy seas) could cause passengers to lose their balance and even fall overboard, or it could result in loss of power in heavy seas, strong currents, or high winds. Loss of control while mooring is another potential hazard.

To minimize accidental activation of the Emergency Stop Switch, the 500 mm (20 inch.) stop switch tether is coiled and can extended to a full 1,300 mm (51 inch.).

SAFE OPERATION OF BOAT

As the operator/driver of the boat, you are responsible for the safety of those aboard and those in other boat around yours, and for following local boating regulations. You should be thoroughly knowledgeable on how to correctly operate the boat, outboard motor, and accessories. To learn about the correct operation and maintenance of the outboard motor, please read through this manual carefully. It is very difficult for a person standing or floating in the water to take evasive action should he or she see a power boat heading in his /her direction, even at a slow speed. Therefore, when your boat is in the immediate vicinity of people in the water, the outboard motor should be shifted to neutral and shut off.

WARNING

SERIOUS INJURY IS LIKELY IF A PERSON IN THE WATER MAKES CONTACT WITH A MOVING BOAT, GEAR HOUSING, PROPELLER, OR ANY SOLID DEVICE RIGIDLY ATTACHED TO A BOAT OR GEAR HOUSING.

SERVICING, REPLACEMENT PARTS & LUBRICANTS

We recommend that only an authorized service shop perform service or maintenance on this outboard motor. Be sure to use genuine parts, genuine lubricants, or recommended lubricants.

MAINTENANCE

As the owner of this outboard motor, you should be acquainted with correct maintenance procedures. It is the operator's responsibility to perform all safety checks and to ensure that all lubrication and maintenance instructions are complied with for safe operation. Please comply with all instructions concerning lubrication and maintenance. You should take the engine to an authorized dealer or service shop for periodic inspection at the prescribed intervals. Correct periodic maintenance and proper care of this outboard motor will reduce the chance of problems and limit overall operating expenses.

MOUNTING

Outboard motor mounting must be performed by trained service person(s) using lift or hoist with sufficient capacity.

SPECIFICATIONS

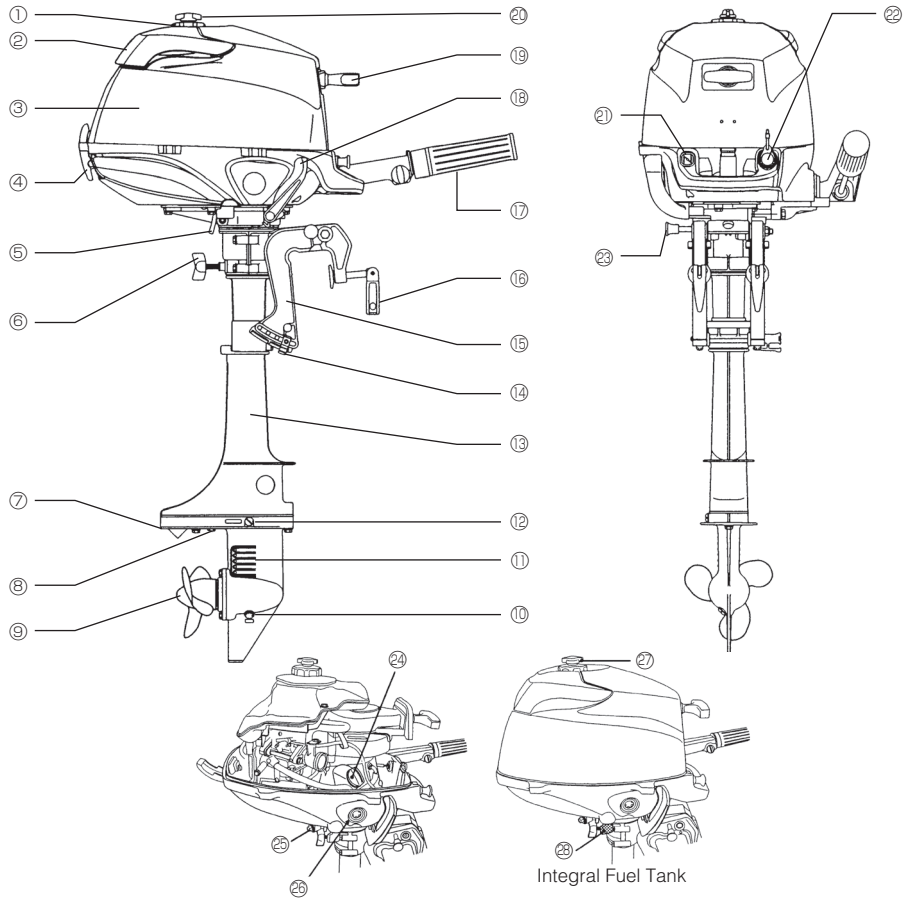
2.5B , 3.5B

Item	MODEL	2.5B		3.5B	
Overall Length	mm (in)	690 (27.2)			
Overall Width	mm (in)	363 (14.3)			
Overall Height S-L	mm (in)	Except for USA and Canada model 1,026 (40.4) · 1,153 (45.4)			
		For USA and Canada model 1,040 (40.9) · 1,167 (45.9)			
Transom Height S-L	mm (in)	435 (17.1) · 562 (22.1)			
Weight S-L	Kg (lb)	18.4 (41) · 19.4 (43)			
Output	kW (HP)	1.8 (2.5)		2.6 (3.5)	
Max. Operating Range	rpm	4,500-5,500		5,000-6,000	
Idle Speed in Forward Gear	rpm	1,200			
Idle Speed in Neutral Gear	rpm	1,300			
Engine Type		4-Stroke			
Number of Cylinder		1			
Bore × Stroke	mm (in)	55 × 36 (2.17 × 1.42)			
Piston Displacement	mL (Cu in)	85.5 (5.2)			
Exhaust System		Above propeller exhaust			
Cooling System		Water cooling			
Engine Lubrication		Splashing system			
Starting System		Manual starter			
Ignition System		Ignitor			
Spark Plug		NGK DCPR6E			
Trim Position		4			
Engine Oil	mL (fl.oz.)	NMMA FC-W certified 10W-30 or API SF, SG, SH, SJ, SL or SM, Approx. 300 (10)			
Gear Oil	mL (fl.oz.)	Genuine Gear Oil or API GL5, SAE #80-90, Approx. 180 (6.1)			
Fuel		Unleaded regular gasoline : Pump posted 87 Octane (research octane rating of 91)			
Clutch		Dog clutch system (F-N)			
Fuel Tank Capacity	L (US gal)	1.0 (0.26) Integral tank			
Gear Reduction Ratio		2.15 (13 : 28)			
Emission Control System		Engine modification (EM)			
Operator Sound Pressure (ICOMIA 39/94) dB(A)		80.1			
Hand Vibration Level (ICOMIA 38/94) m/sec ²		8.9			

* : with manual * Specifications subject to change without notice.

■ NAMES OF PARTS

2.5B , 3.5B



- | | | |
|-----------------------------|----------------------------|--------------------------|
| ① Fuel Tank Cap | ⑪ Water Inlet | ⑲ Choke Knob |
| ② Tilt Handle | ⑫ Oil Plug (Upper) (Level) | ⑳ Stop Switch |
| ③ Top Cowl | ⑬ Drive Shaft Housing | ㉑ Tilt Stopper |
| ④ Cowl Latch | ⑭ Thrust Rod | ㉒ Engine Oil Filter Cap |
| ⑤ Cooling Water Check Port | ⑮ Clamp Bracket | ㉓ Engine Oil Drain Screw |
| ⑥ Steering Adjustment Screw | ⑯ Clamp Screw | ㉔ Engine Oil Level Gauge |
| ⑦ Anti Ventilation Plate | ⑰ Throttle Grip | ㉕ Air Vent Screw |
| ⑧ Anode | ⑱ Shift Lever | ㉖ Fuel Cock |
| ⑨ Propeller | ㉑ Starter Handle | |
| ⑩ Oil Plug (Lower) (Fill) | ㉒ Air Vent Screw | |

Integral Fuel Tank

LOCATIONS OF WARNING LABELS

Locations of warning labels

Warning label regarding owner's manual, top cowl, engine stop switch, engine oil level and unleaded gasoline

WARNING 警告

Read owner's manual very carefully before operating this motor. Give special attention to safety cautions.

Lire très soigneusement le livret d'entretien avant de démarrer ce moteur. Faire très attention aux mesures de sécurité.

Bedienungsanleitung vor der Inbetriebnahme sorgfältig lesen. Beachten Sie besonders die Sicherheitsvorschriften!

ご使用前に必ず取扱説明書をお読み下さい。

Never remove or replace the motor cover while the engine is running.

Ne jamais déposer ou remettre le capot du moteur quand le moteur tourne.

Während des Betriebs niemals die Motorhaube entfernen!

エンジン運転中はモーターカバーを外さないで下さい。

Be sure to connect the emergency stop line to your wrist.

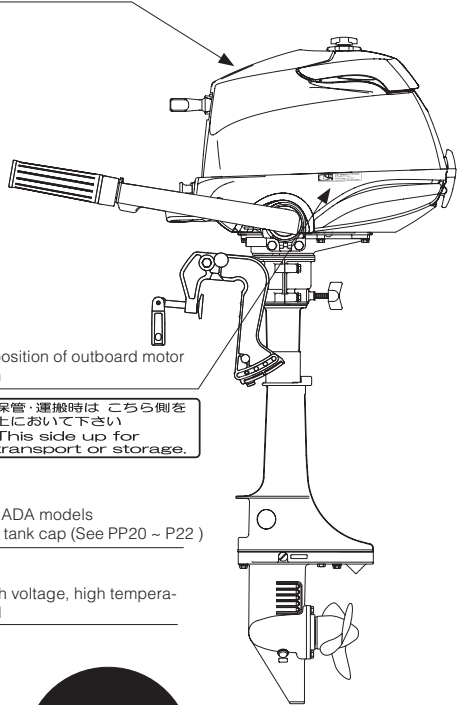
Assurez-vous que le cordon de sécurité soit bien attaché à votre poignet.

Vorsicht! Sie sich, dass die Notstopleine an Ihrem Handgelenk befestigt ist.

運転者落水時最急の危険あり

・運転中はエンジンストップスイッチコードを身体の一部に必ずつけて下さい。

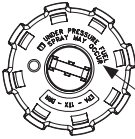
<p>Check oil level before starting.</p> <p>Ölstand vor dem Motorstart überprüfen.</p> <p>Verfüllte le niveau d'huile avant de démarrer.</p> <p>始動前に必ずエンジンオイル量確認。</p>	<p>Unleaded fuel only.</p> <p>Nur unverbletetes Benzin verwenden.</p> <p>Essence sans plomb uniquement.</p> <p>無鉛ガソリンを使用して下さい。</p>
--	--



Warning label on position of outboard motor when setting down

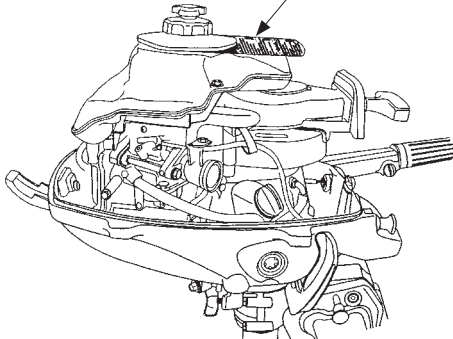
保管・運搬時はこちら側を上において下さい

This side up for transport or storage.



Only for USA and CANADA models
Warning regarding fuel tank cap (See PP20 ~ P22)

Rotating part, high voltage, high temperature warning label



WARNING 警告

Rotating parts, high voltage, high temperature. Do not touch. Danger of injury.

回転部分、高電圧、高温。触ると危険。怪我の恐れがあります。

Rotating parts, high voltage, high temperature. Do not touch. Danger of injury.

Rotating parts, high voltage, high temperature. Do not touch. Danger of injury.

CAUTION 注意

Do not touch the rotating parts. Danger of injury.

回転部分に触らないでください。怪我の恐れがあります。

Do not touch the rotating parts. Danger of injury.

Do not touch the rotating parts. Danger of injury.

Individual symbol marks means as described below.

Warning/ Caution	Read manual thoroughly.	Check oil level.	Use unleaded gasoline only.	Lay as indicated.	Warning, rotating object.	Warning, high voltage.	Warning, high temperature.

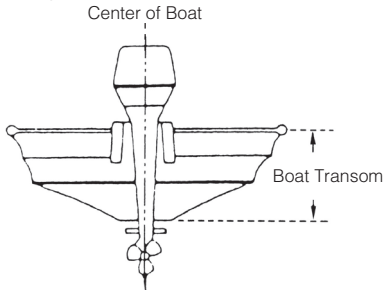
INSTALLATION

1. Mounting the outboard motor on boat

WARNING

Most boats are rated and certified in terms of their maximum allowable horsepower, as shown on the boat's certification plate. Do not equip your boat with an outboard motor that exceeds this limit. If in doubt, contact your dealer. Do not operate the outboard motor until it has been securely mounted on the boat in accordance with the instructions below.

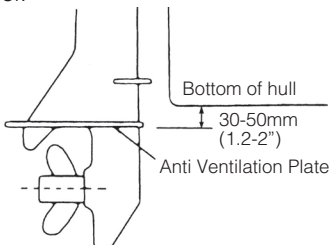
Position ... Above keel line
Set engine at center of boat.



Transom matching

Be sure that the anti ventilation plate of the outboard motor is below the water surface.

If the above condition cannot be met due to the shape of the bottom of your boat, please consult your authorized dealer.



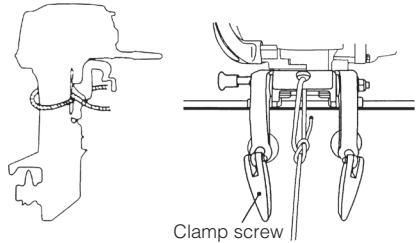
To attach the outboard motor to the boat, tighten the clamp screws by turning their handles.

Also, use the bolts to secure the outboard motor brackets on transom board.

Secure the outboard motor with a rope to prevent loss overboard.

Note

A rope is not included in the standard accessories.



CAUTION

- Before beginning the running test, check that the boat with maximum capacity loading floats on the water in a proper attitude. Check the position of water surface on the driveshaft housing. If the water surface is near the bottom cowling, in high waves, water may enter the engine cylinders.
- Incorrect outboard motor mounting height or existence of underwater object(s), such as hull bottom design, bottom surface conditions or underwater accessories, can cause water spray possibly reaching the engine through an opening of the bottom cowling during cruising. Exposing the engine to such conditions for extended periods can lead to severe engine damage.

⚠ WARNING

If the length of security line being used is long enough to allow the outboard to disengage off the boat transom but is too short to not allow the outboard to submerge behind the boat and stop running, the outboard could continue running and propel itself back into the boat with the propeller rotating under power. This exposes the occupants to serious injury or death.

⚠ WARNING

- Mounting the outboard motor without following this manual can lead to unsafe conditions such as poor maneuverability, lack of control or fire.
- Loose clamp screws and/or mounting bolts can lead to release off or displacement of the outboard motor, possibly resulting in lost of control and / or serious personal injury. Be sure that fasteners are tightened to the specified torque (30 Nm (3.0kgf)13ft·lb). Check fasteners for tightness from time to time.
- Be sure to use outboard mounting fasteners included in outboard motor package or their equivalents in terms of size, material, quality and strength. Tighten fasteners to the specified torque (30 Nm (3.0kgf)13ft·lb). Test cruise to check if fasteners are tightened securely.
- Outboard motor mounting must be performed by trained service person(s) using lift or hoist with sufficient capacity.

⚠ CAUTION

It is recommended to install upper mounting bolts with bolt head at inside surface of transom. Bolts with threaded end at inside surface of transom can cause personal injury.

- Notes
-
1. Apply sealing agent such as silicone sealed between bolts and transom board holes before tightening bolts.
 2. Be sure to tighten mounting bolt nuts to specified torque.



PRE-OPERATING PREPARATIONS

DANGER

Consult an authorized dealer for details on handling gasoline, if necessary.

Gasoline and its vapors are very flammable and can be explosive.

When carrying a fuel tank containing gasoline:

- Close the air vent screw of fuel tank cap, or gasoline vapor will be emitted through the air vent screw, creating a fire hazard.
- Do not smoke.

When or before refueling:

- Stop the engine, and do not start the engine during refueling.
- Do not smoke.
- Be careful not to overfill fuel tank. Wipe up any spilled gasoline immediately.

When or before cleaning the gasoline tank:

- Dismount fuel tank from the boat.
- Place the fuel tank away from every source of ignition, such as sparks or open flames.
- Do the work outdoors or in a well ventilated area.
- Wipe off gasoline well immediately if spilt.

After cleaning gasoline tank:

- Wipe off gasoline well immediately if spilt.
- If the fuel tank is disassembled for cleaning, reassemble carefully. Imperfect assembly may cause a fuel leak, possibly leading to fire or explosion.
- Dispose aged or contaminated gasoline in accordance with local regulations.

1. Recommended gasoline types

CAUTION

Use of improper gasoline can damage your engine. Engine damage resulting from the use of improper gasoline is considered misuse of the engine, and damage caused thereby will not be covered under the limited warranty.

FUEL RATING

TOHATSU engines will operate satisfactorily when using a major brand of unleaded gasoline meeting the following specifications:

USA and Canada - having a posted pump Octane Rating of 87 (R +M)/2 minimum. Premium gasoline (92 [R+M]/2 Octane) is also acceptable. Do not use leaded gasoline.

Outside USA and Canada - Use unleaded gasoline with declared octane rating of 90 RON or over. Use of premium gasoline of 98 RON is also allowed. Use of name-brand leaded gasoline may be allowed only if unleaded gasoline is not available.

GASOLINES CONTAINING ALCOHOL

The fuel system components on your TOHATSU engine will withstand up to 10% alcohol content in the gasoline. But if the gasoline in your area contains either methanol (methyl alcohol) or ethanol (ethyl alcohol), you should be aware of certain adverse effects that can occur. These adverse effects are more severe with methanol. Increasing the percentage of alcohol in the fuel can also worsen these adverse effects. Some of these adverse effects are caused

because the alcohol in the gasoline can absorb moisture from the air, resulting in a separation of the water/alcohol from the gasoline in the fuel tank.

These may cause increased:

- Corrosion of metal parts
- Deterioration of rubber or plastic parts
- Fuel permeation through rubber fuel lines
- Starting and operating difficulties

! WARNING

Fuel leakage can cause fire or explosion, potentially leading to severe injury or loss of life. Every fuel system part should be checked periodically, and especially after long term storage, for fuel leak, change of hardness of rubber, expansion and/or corrosion of metals. In case any indication of fuel leakage or degradation of fuel part is found, replace relevant part immediately before continuing operation.

If the use of gasoline containing alcohol is inevitable, or presence of alcohol is suspected in the gasoline, it is recommended to add a filter that has water separating capability, and check the fuel system for leaks and mechanical parts for corrosion and abnormal wear more frequently.

And, in case any of such abnormality is found, discontinue the use of such gasoline and contact our dealer immediately.

Damages resulting from the use of gasolines that contain alcohol are not covered under the limited warranty.

! WARNING

Do not fill the fuel tank over capacity. The rise of gasoline temperature may cause gasoline to expand which, if overfilled, may leak through air vent screw when it is open. Leaking gasoline is a dangerous fire hazard.

! CAUTION

When operating a TOHATSU engine on gasoline containing alcohol, storage of gasoline in the fuel tank for long periods should be avoided. Long periods of storage, common to boats, create unique problems. In cars, alcohol blend fuels normally are consumed before they can absorb enough moisture to cause trouble, but boats often sit idle long enough for phase separation to take place. In addition, internal corrosion may take place during storage if alcohol has washed protective oil films from internal components.

2. Low permeation fuel hose requirement

EQUIPPED FOR UNITED STATES AND CANADA MODEL

Required for outboards manufactured for sale, sold, or offered for sale in the United States

- TOHATSU engine has used fuel hoses for The Environmental Protection Agency (EPA) requires from January 1, 2011.

3. EPA pressurized fuel tank requirements

EQUIPPED FOR UNITED STATES AND CANADA MODEL

The Environmental Protection Agency (EPA) required integral fuel systems that are produced after August 1, 2011 for use with outboard engines to remain fully sealed (pressurized) up to 7 kPa (1.0 psi). These tanks may contain the following:

- An air inlet that opens to allow air to enter as the fuel is drawn out of the tank.
- An air outlet that opens (vents) to the atmosphere if pressure exceeds 7 kPa (1.0 psi). A hissing noise may be heard as the tank vents to the atmosphere. This is normal.
- When installing the fuel tank cap, turn the cap to the right until you hear two clicks. This signals that the fuel cap is fully seated. A built-in device prevents overtightening.
- The fuel tank has a manual vent screw which should be closed for transportation and full open for operation and cap removal.

Since sealed fuel tanks are not openly vented, they will expand and contract as the fuel expands and contracts during heating and cooling cycles of the outside air. This is normal.

*Please refer to P20 ~ P22 when using this fuel tank.

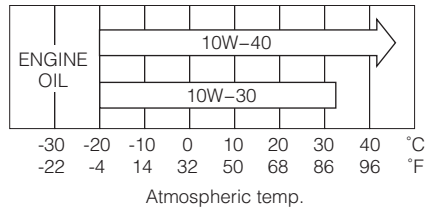
4. Recommended engine oil

Use only high quality 4-stroke engine oil to insure performance and prolonged engine life.

Use NMMA FC-W certified 4-stroke engine oil below.

10W-30: is recommended for use in all temperature.

You can also use oils that carry the API rating of SF, SG, SH, SJ, SL, or SM. Select the appropriate viscosity, based on atmospheric temperature, from the chart below.



⚠ CAUTION

The engine oil is drained for shipping from the factory. Be sure to fill the engine to the proper level before starting engine. (To properly fill the engine with oil follow the instructions in section 9 of this manual)

Note

Use of engine oils that do not meet these requirements will result in reduced engine life, and other engine problems.

5. Break-In

Your new outboard motor and lower unit require break-in for the moving components according to the conditions described in the following time table.

CAUTION

Operating the outboard motor without break-in can shorten service life of the product.
 If any abnormality is experienced during the break-in:
 Discontinue the operation immediately.
 Have the dealer check the product and take proper action(s) if necessary.

5

	1-10min	10min-2hrs	2-3hrs	3-10hrs	After 10hrs
Throttle Position	Idle	Less than 1/2 throttle	Less than 3/4 throttle	3/4 throttle	Full throttle available
Speed		Approx. 3,000 rpm max	Full throttle run allowed for 1 min every 10 min	Approx. 4,000 rpm. Full throttle run allowed for 2 min every 10 min	

Note

Proper break-in allows outboard motor to deliver it full performance for longer service life.

DANGER

Do not operate the outboard motor in closed area or area with no forced ventilation.
 Exhaust gas emitted by this outboard motor contains carbon monoxide that will cause death if inhaled continuously. Inhaling the gas initially causes symptoms such as feeling of sickness, drowsiness and headache.
 During operation of the outboard motor:

- Keep peripheral area well ventilated.
- Always attempt to stay on the windward side of emission.

6. ESG (A device preventing over revolution)

ESG is a device to prevent over revolution of the engine (more than approximately 6,300 rpm).

If you sense that the ESG is activated return to shore at a reduced speed (rpm).

Possible causes of ESG activation are : Worn, broken, bent propeller and shear pin. Slipping propeller rubber, Making sharp turns at high speeds, Trim angle.

○ Note

If the engine speed drops frequently after restarting the engine, please contact your dealer.

ENGINE OPERATION

Before starting

CAUTION

The engine oil is drained for shipping from the factory. Be sure to fill the engine to the proper level before starting engine. (To properly fill the engine with oil follow the instructions in section 9 of this manual)

CAUTION

Before starting engine for the first time after reassembling engine or off-season storage, disconnect stop switch lock and pull the starter handle completely out approximately 10 times in order to prime the oil pump.

1. Filling the fuel

DANGER

Consult an authorized dealer for details on handling gasoline, if necessary.

Gasoline and its vapors are very flammable and can be explosive.

When carrying a fuel tank containing gasoline:

- Close the fuel tank cap and air vent screw of fuel tank cap, or gasoline vapor will be emitted through the air vent screw, creating a fire hazard.
- Do not smoke.

When or before refueling:

- Stop the engine, and do not start the engine during refueling.
- Do not smoke.
- Be careful not to overfill fuel tank. Wipe up any spilled gasoline immediately.

When or before cleaning the gasoline tank:

- Dismount fuel tank from the boat.
- Place the fuel tank away from every source of ignition, such as sparks or open flames.
- Do the work outdoors or in a well ventilated area.
- Wipe off gasoline well immediately if spilt.

After cleaning gasoline tank:

- Wipe off gasoline well immediately if spilt.
- If the fuel tank is disassembled for cleaning, reassemble carefully. Imperfect assembly may cause a fuel leak, possibly leading to fire or explosion.
- Dispose aged or contaminated gasoline in accordance with local regulations.

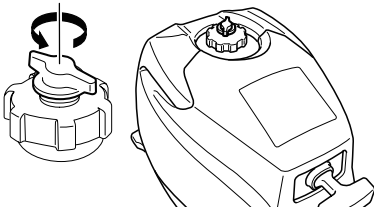
WARNING

When opening fuel tank cap, be sure to follow the procedure described below. Fuel could blast out through the fuel tank cap in case the cap is loosened by using another procedure when internal pressure of fuel tank is raised by heat from sources such as engine or sun light.

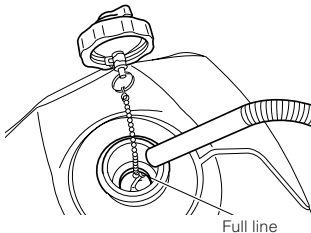
Except for USA and Canada model

- ① Before opening fuel tank cap, turn air vent screw two times counterclockwise to release air pressure in the fuel tank.

Two turns the
air vent screw



- ② Open the fuel tank cap slowly.
- ③ Fill the fuel not to over the shown level.

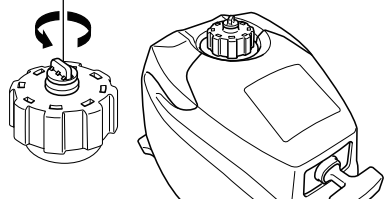


- ④ After filling the tank, close the tank cap.

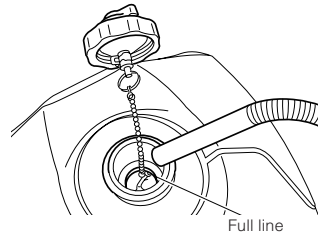
For USA and Canada model

- ① Full open the air vent screw on the tank cap and release internal pressure.

Full open
Air vent screw



- ② Open the fuel tank cap slowly.
- ③ Fill the fuel not to over the shown level.

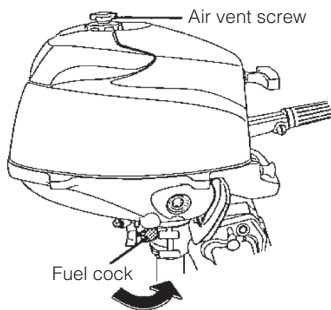


- ④ After filling the tank, close the tank cap until two clicks sound is heard.

2. Feeding the fuel

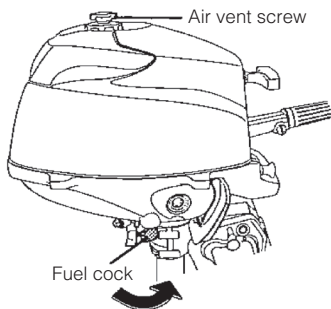
Except for USA and Canada model

- ① Loosen the air vent screw on the tank cap by two turns.
- ② Open the fuel cock.



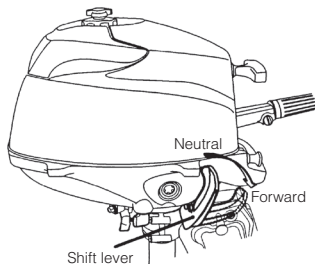
For USA and Canada model

- ① Full open the air vent screw on the tank cap.
- ② Open the fuel cock.

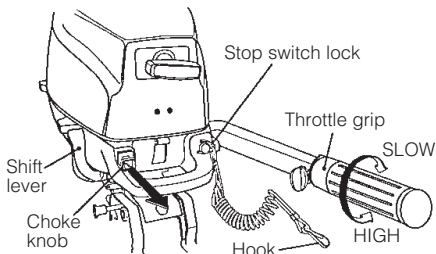


3. Starting

- ① Place the shift lever in the neutral position.



- ② Attach the stop switch tether to a secure place on your arm or clothing. And then, install the lock plate into the engine stop switch.

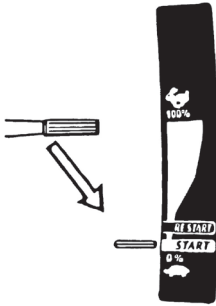


⚠ WARNING

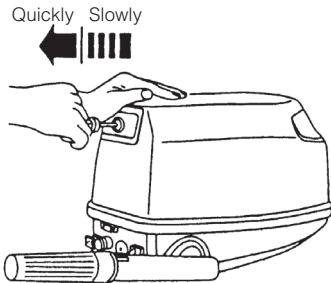
Accidental activation of the Emergency Stop Switch (such as the tether being pulled out in heavy seas) could cause passengers to lose their balance and even fall overboard, or it could result in loss of power in heavy seas, strong currents, or high winds. Loss of control while mooring is another potential hazard.

To minimize accidental activation of the Emergency Stop Switch, the 500 mm (20 inch.) stop switch tether is coiled and can extended to a full 1,300 mm (51 inch.).

- ③ Set the throttle grip to slow position.
- ④ Pull the choke knob out. (Pulling the choke knob is not necessary when the engine is warm. If the engine is warm, open the throttle grip until the RESTART mark.)



- ⑦ Gently pull the starter handle until you feel slight resistance (engagement), and then quickly and strongly pull the handle without a rest.



- ⑧ When the motor starts, push the choke knob back. (in the case the choke knob is used.)

○ Note

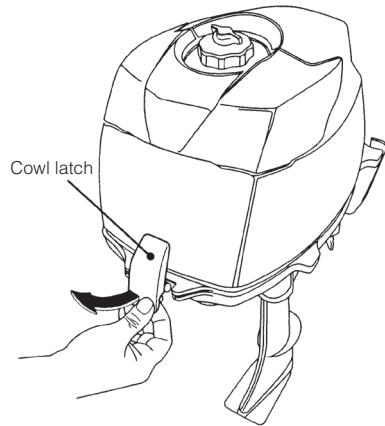
When warming up the engine in cold weather, set the choke knob to half opened position if necessary.

○ Note

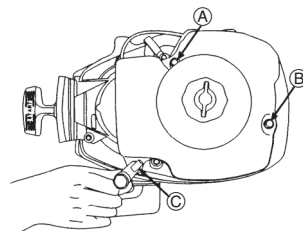
In-gear starting of engine will move the boat immediately, potentially leading to falling down or causing passenger(s) to be thrown overboard.

If the recoil starter fails to operate

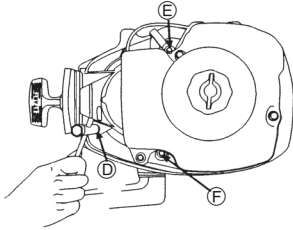
- ⊙ Remove the top cowl and the recoil starter.



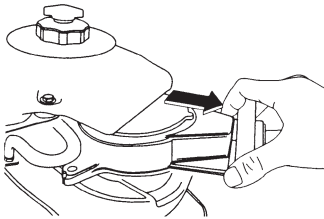
Removing the recoil starter



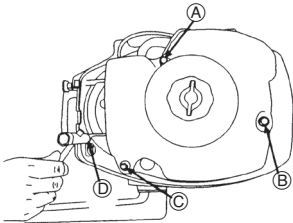
- ① Loosen the three bolts (A,B,C) fastening the tank. (Don't remove the tank fastening bolts.)



- ② Remove the three bolts (D,E,F) fastening the recoil starter.



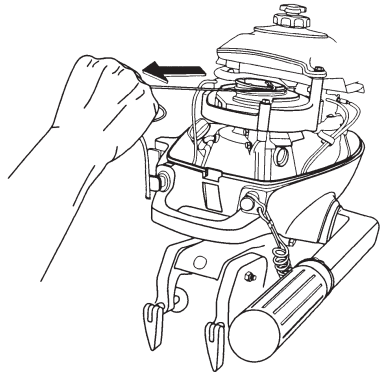
- ③ Remove the recoil starter.



- ④ Tighten the three bolts (A,B,C) fastening the tank and one bolt (D) fastening the recoil starter.

- ⊙ Confirm that the shift lever is at Neutral (N) position.
- ⊙ Wrap a rope around the starter pulley then pull quickly to start.
- ⊙ Use a 10 mm socket wrench as a rope handle.

- ⊙ Reinstall top cowl after engine starts.



! WARNING

Be careful that your clothes or other items do not get caught in the rotating engine parts.
 To prevent accident and injury, do not re-attach the recoil starter after the engine has been started using the emergency starter rope. Be sure to put the top cowl back on.
 Immediately contact an authorized dealer when reaching shore.

! WARNING

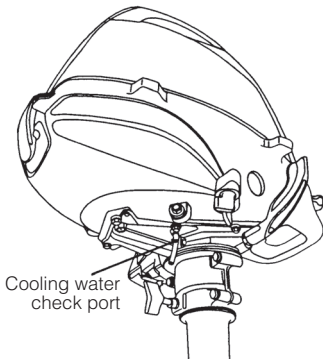
- Be sure that no bystander(s) is within 2 meters from back of starting operator.
- Do not operate the outboard motor with top cowl removed from the power unit, or contacting turning flywheel which can lead to serious personal injury.

4. Warming up the engine

Warm the engine at low engine speeds for about three minutes. This allows the lubricating oil to circulate to all parts of the engine. Operating the engine without warm up shortens the engine's life.

Be sure to check that cooling water is coming out of the cooling water check port during warm up.

⚠ CAUTION
If the engine is operated without water discharging from the check port, the engine may over heat.



⚠ CAUTION
Be sure to stop engine immediately if cooling water check port is not discharging water, and check if cooling water intake is blocked. Operating engine could lead to overheating potentially leading to engine damage. Consult an authorized dealer if the cause cannot be found.

Engine speeds

Idling speed after warming up.

Remark: In case of cold engine starting, idling speed is increased about 300 rpm for several minutes.

Clutch in (In gear)	Clutch off (Out of gear)
1,200rpm	1,300rpm

PROPELLER SELECTION

Propeller must be selected that will allow the engine to reach recommended rpm when cruising at wide-open throttle.

Wide-open throttle rpm range	
2.5	3.5
4,500~5,500rpm	5,000~6,000rpm

Genuine propellers are listed on PROPELLER TABLE of this manual.

5. Forward and reverse

WARNING

Before shifting into forward, or reverse, make sure that boat is properly moored and outboard motor can be steered fully to the right and left. Make sure that no swimmer(s) is ahead or astern of the boat.

WARNING

- Attach other end of emergency stop switch tether to the operator's clothing or arm and keep it attached during cruising.
- Do not attach the tether to a part of clothing that can be torn easily when pulled.
- Arrange the tether so that will not be caught by any object when pulled.
- Be careful not to pull the tether accidentally during cruising. Unintentional stop of engine can cause loss of control of outboard motor. Rapid loss of engine power can lead to falling down or causing passenger(s) to be thrown overboard.

CAUTION

The shear pin breaks when the propeller is shocked, otherwise, the shear pin may break if shifting is done at a high motor speed.

Note

When moving astern, be sure to operate the motor at a low speed without unnecessary increase of the motor speed.

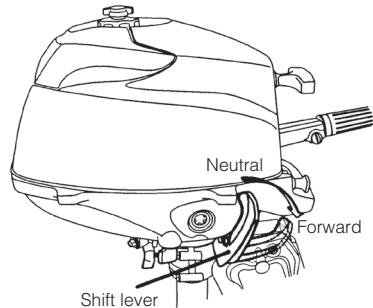
WARNING

Severe damage, and personal injury, may occur if shifting at high engine speed. Engine must be in the slow idle position before shifting is attempted.

Motor operation mode for moving ahead and astern can be shifted by the shift lever.

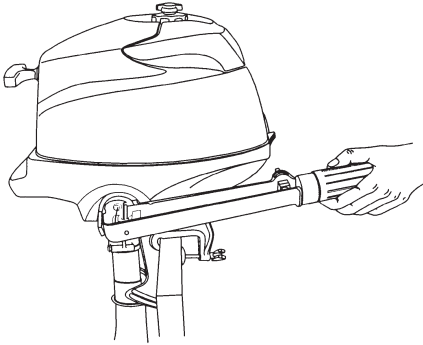
■ Forward

Turn the throttle grip to the low speed position. As soon as the engine speed turns down to the lowest, quickly pull the shift lever to the Forward (F) side.



■ Reverse

Turn the engine speed to the lowest in the same manner as the operation for moving ahead. After setting the shift lever to the Neutral (N) position and the handle upright, turn the outboard motor at an angle of 180° and quickly turn the shift lever to the Forward (F) side.



■ Driving in shallows

When driving in shallows, operate the motor at the lowest speed paying careful attention to the depth of the water and obstacles.

! WARNING

Before shifting, make sure that no swimmer(s) or obstacle(s) is ahead or astern of the boat.

! CAUTION

Be sure to warm up engine well before starting cruise. Operating cold engine may cause damage to your motor.

! WARNING

During shallow water operation, be careful not to place your hand between the swivel bracket and the stern bracket. Be sure to tilt the outboard down slowly.

! WARNING

- Run at lowest possible speed during cruising using shallow water drive.
- Tilt lock is disabled when in shallow water drive position.
- When driving shallow water, be careful not to strike outboard motor against sea bottom, or propeller may be pushed out of water, resulting in loss of control.

! WARNING

Do not tilt up or down outboard motor when swimmer(s) or passenger is near to prevent them from being caught between outboard motor body and clamp bracket in case the outboard motor body falls.

! CAUTION

Do not tilt up outboard motor while engine operates, or no cooling water may be fed, leading to engine seizure due to overheating.

○ Note

Slow down to trolling speed, and shift into neutral before setting outboard motor to shallow water drive position.

○ Note

Idle speed may be higher during warming up of engine. If shifted to Forward during warming up, it may be difficult to shift back to neutral. In such case, stop engine, shift to neutral, and restart engine to warm up.

○ Note

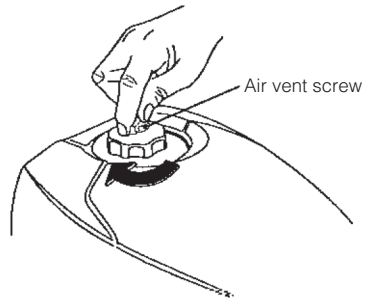
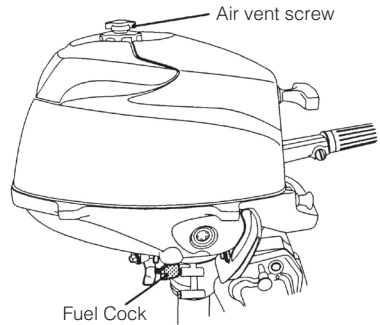
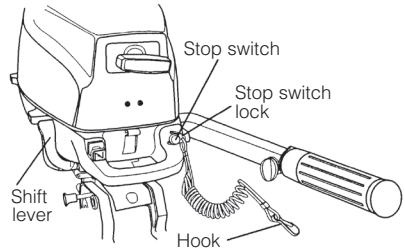
Frequent shifting to forward can accelerate wear or degradation of parts. In such case, replace gear oil earlier than the period specified.

6. Stopping

- ① Turn the throttle grip to the low speed position.
- ② Set the shift lever to the Neutral (N) position. After high-speed operation, continue idling for 2 to 3 minutes.
- ③ Continue pressing the stop switch until the motor stops. Or pull the stop switch lock out.
- ④ Close the fuel cock.
- ⑤ Tighten the air vent screw of the tank cap.

WARNING

Avoid serious injury or death from a gasoline fire or explosion.
Ensure that is ④ and ⑤.



○ Notes

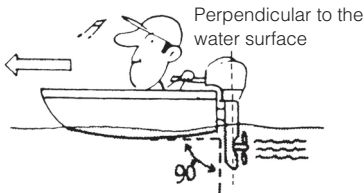
- After stopping the engine, close the air vent screw on the tank cap.
- Close the fuel cock. (Integral fuel tank)

7. Trim angle

The trim angle of the outboard motor can be adjusted to suit the transom angle of the hull, and load conditions. Choose an appropriate trim angle that will allow the anti-ventilation plate to run parallel to the water surface during operation.

■ Proper trim angle

The position of the thrust rod is correct if the hull is horizontal during operation.



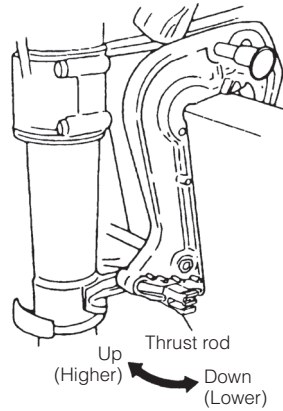
■ Improper trim angle (bow rises to high)

Set the thrust rod lower if the bow of the boat rises above horizontal.



■ Improper trim angle (bow dips into the water)

Set the thrust rod higher if the bow of the boat is below horizontal.



! WARNING

- Do not put hand or finger in between outboard motor body and clamp bracket when adjusting trim angle to prevent injury in case the outboard motor body falls.
- Unsuitable trim position can cause loss of control of boat. When testing a trim position, run boat slow initially to see if it can be controlled safely.

! WARNING

- Excessive trim up or down may lead to unstable boat operation, potentially causing the steering difficulty that leads to accident during cruising.
- Do not cruise at high speed if improper trim position is suspected. Stop the boat and readjust trim angle before continuing cruise.

8. Tilt up, tilt down

WARNING

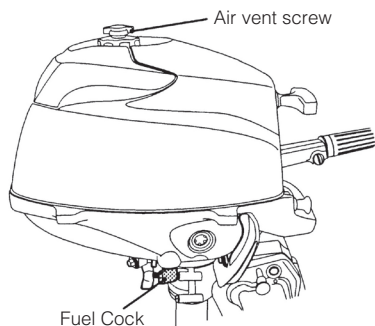
When tilting up or down, be careful not to place your hand between the swivel bracket and the stern bracket. Be sure to tilt the outboard motor down slowly.

Note

Be sure to stop the motor during tilt-up or tilt-down operation.

Tilt up

- ① Close the fuel cock and tighten the air vent screw of the tank cap.
- ② Tilt up the outboard motor fully to your side and press the tilt stopper knob inside to set it up.

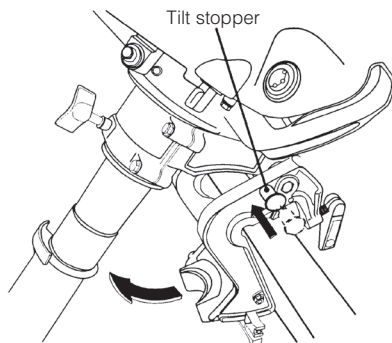


CAUTION

Do not tilt up outboard motor during operation, or engine may be damaged from overheating due to lack of sufficient cooling water.

Tilt down

Pull the outboard motor to your side and draw the tilt stopper knob out for tilting down.

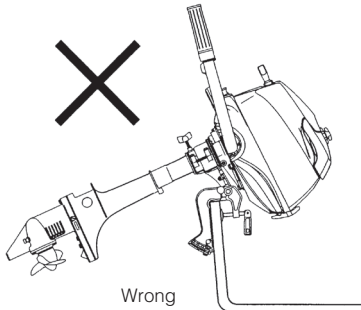
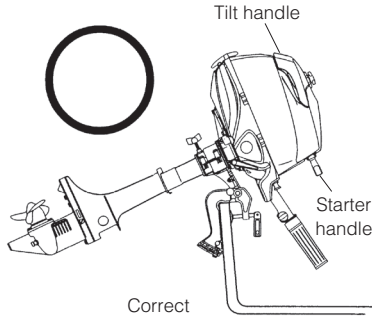


WARNING

Do not tilt up or down outboard motor when swimmer(s) or passenger is near to prevent them from being caught between outboard motor body and clamp bracket in case the outboard motor body falls.

9. Outboard motor position in tilt up

When the outboard motor is in the tilt-up position, the tilt handle side must be in the upward direction (the starter handle side must look downward).



⚠ CAUTION

The outboard motor is set in the correct tilt-up position in the usual condition, however, the outboard motor may be set in the wrong tilt-up position if the motor direction is sharply changed in course of tilting up.

If the outboard motor is set in a wrong position, try to tilt it up once more to set it in the correct position.

○ Note

For U.S.A. market only

High altitude:

When engine operates at high altitude engine may need to have a high altitude kit installed. Otherwise, operating the engine at high altitude may increase its emissions and decrease fuel efficiency and performance. Please see "LIMITED WARRANTY INFORMATION" for more detail.

REMOVING AND CARRYING THE OUTBOARD MOTOR

1. Removing the outboard motor

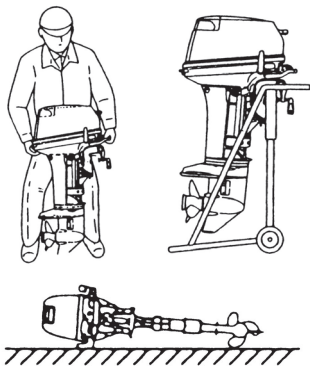
- ① Stop the engine.
- ② Close the fuel lock.
- ③ Remove the outboard motor from boat and completely drain the water from the gear case.

CAUTION

Engine may be hot immediately after operating and could cause burns if touched. Allow engine to cool down before attempting to carry the outboard.

2. Carrying the outboard motor

Keep the outboard motor in a vertical position when carrying.



WARNING

- Close air vent screw of fuel tank and fuel cock before carrying or storing outboard motor and fuel tank, or fuel may leak, potentially catching fire.
- Do not give a shock to an outboard motor during transportation. It becomes a cause of breakage.

3. Storing the outboard motor

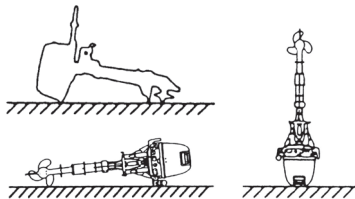
Outboard motor should be stored in a vertical position.

Note

If the outboard motor must be laid down be sure the tiller handle faces up as shown in the drawing above. Elevate power unit 2 inches to 4 inches if traveling to avoid oil spillage.

CAUTION

Do not carry or store outboard motor in any of positions described below. Otherwise, engine damage or property damage could result from leaking oil.



TRAILERING

! WARNING

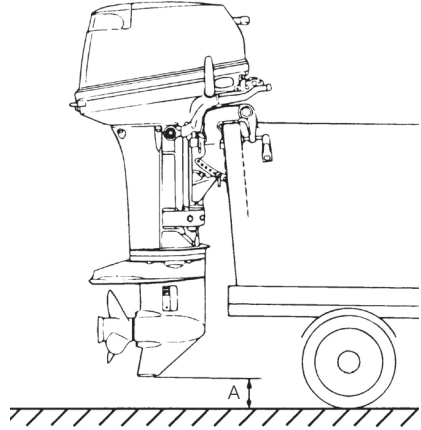
Do not go under outboard motor tilted up even if it is supported by support bar, or accidental fall of outboard motor could lead to severe personal injury.

! WARNING

Close air vent screw of fuel tank and fuel cock before carrying or storing outboard motor and fuel tank, or fuel may leak, potentially catching fire.

! CAUTION

When trailering the outboard motor should be in a vertical (normal running) position, fully down. Trailering in the tilted position may cause damage to the outboard motor, boat, etc.
If trailering with outboard motor fully down is not available (the gear case skeg is too close to the road in a vertical position), fix the outboard motor securely using a device (like a transom saver bar) in the tilted position.



A: Ground clearance should be provided sufficiently.

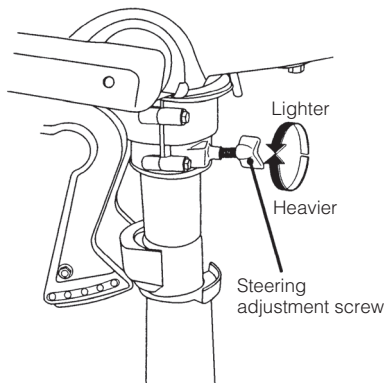
! CAUTION

The tilt support device supplied on your outboard motor is not intended for towing. It is intended to support the outboard motor while the boat is docked, beached, etc.

ADJUSTMENT

1. Steering friction

The steering friction can be adjusted in accordance with your preference by turning the adjustment screw.

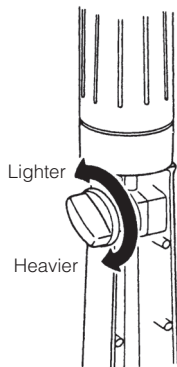


Note

The steering adjustment screw is used to adjust the friction load of the steering, but not to fix the steering. Excess tightening of the adjustment screw may cause damage to the swivel bracket.

2. Throttle grip

Friction adjustment of the throttle grip can be made with the throttle adjustment screw.



WARNING

Do not overtighten the throttle grip or remote control tensioner or it could result in difficulty of movement resulting in the loss of control causing an accident and could lead to severe injury.

INSPECTION AND MAINTENANCE

Care of your outboard motor

To keep your outboard motor in the best operating condition, it is very important that you perform daily and periodic maintenance as suggested in the maintenance schedules that follow.

CAUTION

- Your personal safety and that of your passengers depends on how well you maintain your outboard motor. Carefully observe all of the inspection and maintenance procedures described in this section.
- The maintenance intervals shown in the checklist apply to an outboard motor in normal use. If you use your outboard motor under severe conditions such as frequent full-throttle operation, frequent operation in brackish water, or for commercial use, maintenance should be performed at shorter intervals. If in doubt, consult your dealer for advice.
- We strongly recommend that you use only genuine replacement parts on your outboard motor. Damage to your outboard motor arising from the use of other than genuine parts is not covered under the warranty.

EPA Emissions Regulations

EPA (United States Environmental Protection Agency) has emission regulations regulating air pollution from new outboard motors. All new outboard motors manufactured by us are certified to EPA as conforming to the requirements of the regulations. This certification depends upon factory standards. Therefore, factory specifications must be followed when servicing emission related controls, or making adjustments. **Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine SI (Spark Ignition) engine repair establishment or individual.**

1. Daily Inspection

Perform the following checks before and after use.



WARNING

Do not use outboard motor if any abnormality is found during pre-operation check or it could result in severe damage to the motor or severe personal injury.

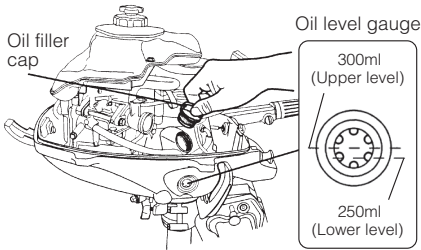
Item	Points to Check	Remedy
Fuel System	<ul style="list-style-type: none"> ● Check the amount of fuel in the tank. ● Check for debris in the fuel filters. ● Check the rubber hoses for fuel leakage. 	Fill fuel Clean or Replace Replace
Fuel Tank Cap	<ul style="list-style-type: none"> ● Check for crack, leakage, damage in the fuel tank cap. ● Check for crack, damage in the gasket and teather. ● Check for leakage at full close. ● Check for ratchet performance. 	Replace Replace Replace Replace
Engine oil	<ul style="list-style-type: none"> ● Check the oil level, dirt and entering water. 	Fill fuel or Replace
Electrical Equipment	<ul style="list-style-type: none"> ● Check that the stop switch functions normally and make sure the lock plate is in right location ● Check cords for loose connections and damage. ● Check the spark plug for dirt, wear and carbon build-up. 	Remedy or replace Correct or replace Clean or replace
Throttle System	<ul style="list-style-type: none"> ● Check that the carburetor choke valve functions normally. ● Check carburetor linkage is warking normally when turning the throttle grip. 	Replace Correct
Recoil Starter	<ul style="list-style-type: none"> ● Check the rope for wear and chafing. ● Check the ratchet engagement. 	Replace Correct or replace
Clutch and Propeller System	<ul style="list-style-type: none"> ● Check that the clutch engages correctly when operation the shift lever. ● Visually check the propeller and shear pin for bent or damaged blades. ● Check that the split pin is on the propeller. 	Adjust Replace
Installation of Motor	<ul style="list-style-type: none"> ● Check the clamp screws attaching the motor to the boat for tightness. ● Check the thrust rod installation. 	Tighten
Cooling Water	<ul style="list-style-type: none"> ● Check that cooling water is discharged from the cooling water check port after the engine has started. 	
Tools and Spares	<ul style="list-style-type: none"> ● Check that there are tools and spare parts for replacing spark plugs, the propeller, etc. ● Check that you have the spare rope. 	
Other parts	<ul style="list-style-type: none"> ● Check if the anode is securely installed. ● Check the anode for corrosion and deformation. 	Repair if necessary Replace

Maintaining engine oil

If the engine oil level is low, the life of the engine will be shortened significantly.

■ Checking oil level

- ① Stop the engine and set it in a vertical position.
- ② Remove the top cowl.
- ③ Check the oil level by the oil level gauge.



○ Notes

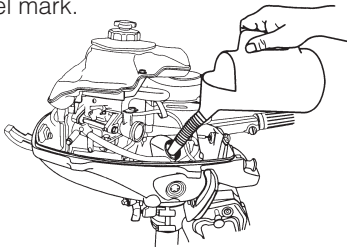
The oil level should be checked when the engine is cold.

○ Notes

Consult with an authorized dealer if the engine oil is milky color, or appears contaminated.

■ Filling engine oil

If the oil level is low, or at lowest mark, add recommended oil to the upper level mark.



⚠ CAUTION

- Do not add engine oil of brand and grade other than existing one. In case engine oil of other brand or grade is added, drain all oil and ask dealer for treatment.
- In case other than engine oil such as gasoline is put in the oil chamber, empty the chamber and ask dealer for treatment.
- When replenishing engine oil, be careful not to allow entry of foreign matters such as dust and water into oil chamber.
- Wipe off engine oil well immediately if spilled.
- Do not replenish engine oil over upper limit. If overfilled, remove oil to upper limit. If engine oil is over the upper limit, it can leak potentially leading to engine damage.

Washing outboard motor

If outboard motor is used in salt water, brackish water or water with a high acidic level, use fresh water to remove salt, chemicals or mud from exterior and cooling water passage after every cruising or before storing outboard motor for long time. Before flushing, remove the propeller and the forward thrust holder.

⚠ CAUTION

Keep cooling water passage free of clogs, or lack of cooling water flow could lead to engine overheating, potentially resulting in engine trouble.

○ Notes

It is recommended to check chemical properties of water on which your outboard motor is regularly used.

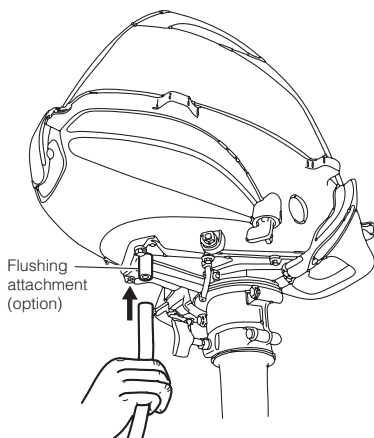
⚠ WARNING

Do not start engine without removing propeller, or accidentally turning propeller could cause personal injury.

⚠ WARNING

Never start or operate the engine indoors or in any space which is not well ventilated. Exhaust gas contains carbon monoxide, a colorless and odorless gas which can be fatal if inhaled for any length of time.

- Remove the water plug from the motor, and screw in the flushing attachment. Connect a hose to the flushing attachment.
- With the shift lever in Neutral (N), run the engine at a idle speed while flushing the cooling system to ensure all sea water and mud are removed.



⚠ CAUTION

Keep engine at idle speed during flushing.

Replacing the propeller and shear pin

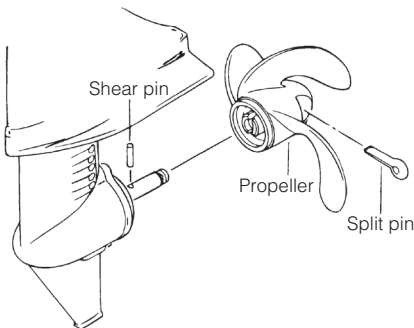
A worn-out or bent propeller will lower the motor's performance, and cause engine trouble.

Before removing the propeller, remove the spark plug caps from the spark plugs to protect against personal injury.

! WARNING

Do not begin propeller removal and installation procedure with spark plug caps attached, shift in forward, engine stop cord attached to the switch, or engine could accidentally start leading to serious personal injury. Disconnect battery cable if possible.

- ① Pull out the split pin from the propeller boss and remove the propeller from the shaft.
- ② Remove the shear pin from the shaft.
- ③ Install a new shear pin.



! WARNING

Do not hold propeller with hand(s) when removing propeller split pin. Put a piece of wood block between propeller blade and anti-ventilation plate to hold propeller.

! CAUTION

- Do not reuse split pin.
- After installing split pin, spread the pin apart to prevent it from falling out which could lead to the propeller coming off during operation.

Replacing the spark plug

! WARNING

- Do not reuse spark plug with damaged insulation, or sparks can leak through crack, potentially leading to electric shock, explosion and/or fire.
- Do not touch spark plugs immediately after stopping engine as they will be hot and could cause severe burns if touched. Allow motor to cool down first.

If the spark plug is fouled, has carbon build up, or is worn, it should be replaced.

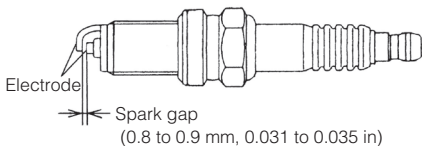
When reusing spark plugs, remove dirt from the electrodes and adjust spark gap to specification.

○ Notes

When inspecting the plug, always clean the gasket surface and use a new gasket. Wipe off any dirt from the threads and screw in the spark plug to the correct torque.

- ① Stop the engine.
- ② Remove the top cowl.
- ③ Remove the spark plug caps.
- ④ Remove the spark plugs by turning it counter-clockwise, using a 5/8" socket wrench and handle.
- ⑤ Attach spark plug and tighten to specified torque.

Use spark plug NGK DCPR-6E.



○ Notes

◎ Spark plug torque :

18.0Nm(13.3ft-lb)(1.8kgf-m)

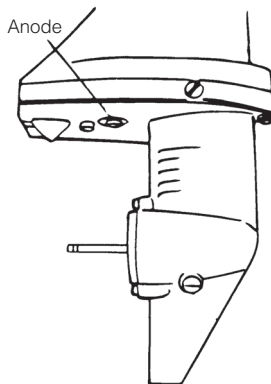
If a torque-wrench is not available when you are fitting a spark plug, a good estimate of the correct torque is 1/4 to 1/2 a turn past finger-tight. Have the spark plug adjusted to the correct torque as soon as possible with a torque-wrench.

Replacing the anode

A sacrificial anode protects the outboard motor from galvanic corrosion. Anode is located on the gear case. When the anode is eroded more than 2/3, replace it.

○ Notes

- Never grease or paint the anode.
- At each inspection re-tighten the anode attaching bolt. As it is likely to be subjected to electrolytic corrosion.



⚠ WARNING

- Be sure that outboard motor is secured to transom or service stand, or accidental drop or fall of outboard motor could lead to severe personal injury.
- Be sure to lock outboard motor if it is tilted up, or accidental fall of outboard motor could lead to severe personal injury.
- Do not go under outboard motor tilted up and locked, or accidental fall of outboard motor could lead to severe personal injury.

2. Periodic Inspection

It is important to inspect and maintain your outboard motor regularly. At each interval on the chart below, be sure to perform the indicated servicing. Maintenance intervals should be determined according to the number of hours or number of months, whichever comes first.

Description		Inspection intervals				Inspection procedure	Remarks
		First 20 hours or 1 month	Every 50 hours or 3 months	Every 100 hours or 6 months	Every 200 hours or 1 year		
Fuel System	Carburetor *1			○	○	Strip clean, and adjust.	
	Fuel filter	○	○	○	○	Check and clean or Replace if necessary.	
	Piping/Hoses *2	○	○	○	○	Check and clean or Replace if necessary.	
	Fuel tank *2	○	○	○	○	Clean	
	Fuel tank cap *2	○	○	○	○	Check and clean or Replace if necessary.	
	Fuel pump *3	○	○	○	○	Check and clean or Replace if necessary.	Disassemble and check each 300 hours.
Ignition	Spark plug	○		○	○	Check gaps. Remove carbon deposits or Replace if necessary.	0.8-0.9mm (0.031-0.035 in)
	Ignition timing *1	○		○	○	Check timing	
Starting System	Starter rope *1	○	○	○	○	Check for wear or chafing.	
Engine	Engine oil	Replace ○		Replace ○	Replace ○	Replace if necessary.	(Reference P42)
	Valve Clearance *1	○		○	○	Check & adjust.	
	Thermostat *1			○	○	Check and Replace if necessary.	
Lower Unit	Propeller	○	○	○	○	Check for bent blades, damage, wear.	
	Shear pin and split pin	○	○	○	○	Check or Replace if necessary.	
	Gear oil	Replace ○		Replace ○	Replace ○	Change or replenish-oil and check for water leaks.	180mL (6.1 fl. oz)
	Water pump *1		○	○	○	Check for wear or damage.	Replace impeller every 12 months.
Bolts and Nuts		○		○	○	Retighten	
Sliding and Rotating Parts. Grease Nipples.		○	○	○	○	Apply and pump in grease.	
Outer Equipment		○	○	○	○	Check for corrosion.	
Anode			○	○	○	Check for corrosion and deformation.	Replace if necessary.

*1 Have this handled by your dealer.

*2 In USA, you have to use EPA approved part. (See P16 - P17).

*3 Equipped for US and CANADA model.

Notes

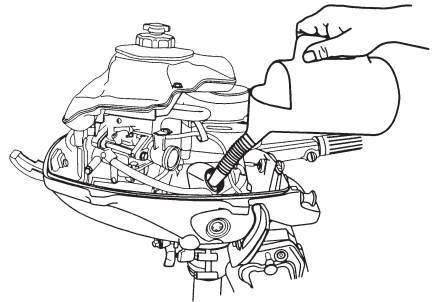
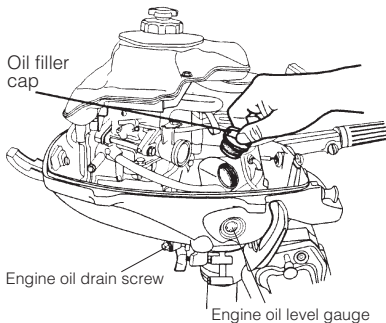
Your outboard motor should receive careful, and complete inspection at 300 hours. This is the best time for major maintenance procedures to be carried out.

Replacing engine oil

Engine oil mixed with dust or water will dramatically shorten the life of the engine.

To replacing engine oil:

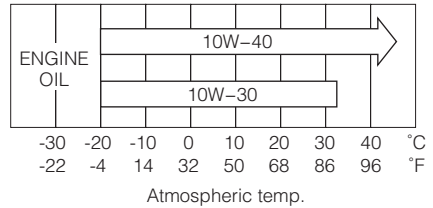
- ① Stop the engine and set it in a tilted position.
- ② Remove the top cowl and oil filler cap. Allow it to cool.
- ③ Put a oil drain pan under the oil drain screw.
- ④ Remove the oil drain screw and completely drain oil from the engine.
- ⑤ Tighten the oil drain screw.
- ⑥ Fill the engine through filler port with recommended oil (see chart below) to the upper level mark.
- ⑦ Tighten the oil filler cap.



Use only high quality 4-stroke engine oil to insure performance and prolonged engine life.

Use NMMA FC-W certified 4-stroke outboard oil below.

10W-30: is recommended for use in all temperature.



You can also use oils that carry the API rating of SF, SG, SH, SJ, SL, or SM. Select the appropriate viscosity, based on atmospheric temperature, from the chart below.

CAUTION

Use of engine oils that do not meet these requirements will result in reduced engine life, and other engine problems.

⚠ CAUTION

You may be injured due to high engine temperatures if you fill engine oil just after stopping. Changing engine oil should be done after the engine has been cooled.

⚠ CAUTION

- Do not overfill engine oil, or engine oil could leak and/or engine could be damaged. If engine oil level is over upper limit marks of oil gauge, drain oil to level lower than upper limit.
- Be sure that outboard motor is in upright and level position when checking or changing oil.

○ Notes

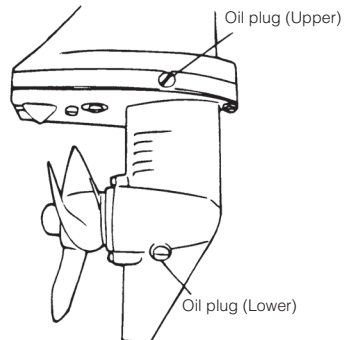
- If any amount of water is found in engine oil, making it milky white, consult dealer.
- If engine oil is contaminated with fuel, emitting strong fuel smell, consult dealer.
- Some oil dilution is normal if engine is idled or trolled for long periods, especially in cooler water temperatures.

Replacing gear oil

⚠ WARNING

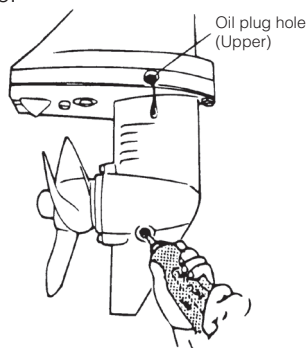
- Be sure that outboard motor is secured to transom or service stand, or accidental drop or fall of outboard motor could lead to severe personal injury.
- Be sure to lock outboard motor if it is tilted up, or accidental fall of outboard motor could lead to severe personal injury.
- Do not go under outboard motor tilted up and locked, or accidental fall of outboard motor could lead to severe personal injury.

- ① Remove the oil plugs (upper and lower), and completely drain the gear oil into a pan.

**⚠ CAUTION**

Do not reuse oil plug gasket. Always use new gasket and tighten oil plug properly to prevent entry of water into lower unit.

- ② Insert the oil tube nozzle into the lower oil plug hole, and fill with gear oil by squeezing the oil tube until oil flows out of the upper plug hole.



- ③ Install the upper oil plug, and then remove oil tube nozzle and install the lower oil plug.

○ Notes

If water in the oil, giving it a milky colored appearance. Contact your dealer.

○ Notes

Use genuine gear oil or the recommended one (API GL-5: SAE #80 to #90).
Required volume: approx. 180 ml.

3. Off-season storage

Before you put your outboard motor in storage, it is a good opportunity to have it serviced and prepared by your dealer.

CAUTION

Before servicing the motor for storage:

- Remove the spark plug caps from the spark plugs.
- Do not run the motor out of the water.

- ① Wash the engine exterior and flush the cooling water system thoroughly with fresh water. Drain the water completely. (Reference P38) Wipe off any surface water with an oily rag.
- ② Use a dry cloth to completely wipe off water and salt from the electrical components.
- ③ Drain all fuel from the fuel hoses, and carburetor, and clean these parts.
Keep in mind that if gasoline is kept in the carburetor for a long time, gum and varnish will develop, causing the float valve to stick, restricting the fuel flow.
- ④ Remove the spark plugs and spray storage oil (available from an authorized dealer) into the combustion chamber through the spark plug holes while slowly turning the motor over using the recoil starter.
- ⑤ Change the engine oil.
- ⑥ Change the gear oil in the gear case.

- ⑦ Apply grease to the propeller shaft.
- ⑧ Apply rust prevention to nuts and bolts, etc.
- ⑨ Stand the outboard motor up vertically in a dry place, or tiller handle face up and placed. (Reference P32)

WARNING

Be sure to use cloth to remove fuel remaining in the cowl and dispose of it in accordance with local fire prevention and environment protection regulations.

4. Pre-season check

Check that the shift and throttle function properly.
(Be sure to turn the propeller shaft when checking the shift function or else the shift linkage may be damaged.)

Notes

The following steps must be taken when first using the engine after winter storage.

- ① Fill fuel tank completely.
- ② Warm up the engine for 3 minutes in the Neutral (N) position.
- ③ Run the engine for 5 minutes at the slowest speed.
- ④ Run the engine for 10 minutes at half speed.

In Steps ② and ③ above, the oil used for storage inside the engine will be flushed out to assure optimum performance.

5. Motor submerged in water

After taking your outboard motor out of the water, immediately take it to your dealer.

The following are the emergency measures to be taken for a submerged outboard motor, if you can not take it your dealer right away.

- ① Wash the outboard motor with fresh water to remove salt or dirt.
- ② Remove the engine oil drain screw and completely drain water and oil from the engine.
- ③ Remove the spark plugs, and completely drain the water from the engine by pulling the recoil starter several times.

Replace oil filter and oil to the correct level.

The oil and filter may need to be changed again after running a short period to get all moisture completely out of the crankcase.

- ④ Inject a sufficient amount of engine oil through the spark plug holes. Pull the recoil starter several times to circulate the oil throughout the outboard motor.
- ⑤ Fill new engine oil.

CAUTION

Do not attempt to start submerged outboard motor immediately after it is recovered, or engine could be severely damaged.

6. Cold weather precautions

If you moor your boat in cold weather at temperatures below 0°C (32°F), there is the danger of water freezing in the cooling water pump, which may damage the pump, impeller, etc. To avoid this problem, submerge the lower half of the outboard motor into the water.

7. Checking after striking underwater object

Striking the sea bottom or an underwater object may severely damage the outboard motor. Immediately bring the outboard motor to the dealer and ask for the following checks.

- ① Looseness or damage of power unit installation bolts, gear case and extension case bolts, propeller shaft housing bolts, propeller or propeller shaft upper and lower mount rubber bolts, and/or mount bracket bolts.

Ask an authorized dealer to tighten any loose bolts and nuts, and to replace damaged parts.

- ② Damage to mount rubber, the tilt stopper, thrust rod, gears and clutch, and/or propeller.

Ask an authorized dealer to replace damaged or defective parts.

TROUBLESHOOTING

If you encounter a problem, consult the check list below to determine the cause and to take the proper action.

An authorized dealer will always be happy to provide any assistance and information.

	Engine failing to start	Engine starting but stopping soon	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Boat speed low	Overheating of engine	Possible cause
FUEL SYSTEM	●	●							Empty fuel tank
	●	●	●	●		●	●		Deformed or damaged fuel hose
	●	●	●	●		●	●	●	Closed air vent on fuel tank
	●	●	●	●		●	●	●	Clogged fuel filter, fuel pump, or carburetor
			●	●		●	●	●	Use of improper engine oil
	●	●	●	●			●	●	Use of improper gasoline
	●			●					Excessive supply of fuel
	●	●	●	●		●	●	●	Poor carburetor adjustment
E/SYSTEM	●	●	●	●		●	●	●	Spark plug other than specified
	●	●	●	●		●	●		Dirt,soot,etc. on spark plug
	●	●	●	●		●	●		No spark or weak spark
	●								Short circuit of engine stop switch

	Engine failing to start	Engine starting but stopping soon	Poor idling	Poor acceleration	Engine speed abnormally high	Engine speed abnormally low	Boat speed low	Overheating of engine	Possible cause
ELECTRICAL SYSTEM	●		●	●		●	●	Ignition timing incorrect	
	●							Lock plate not fitted to stop switch	
	●							Disconnection of wire or loose ground connection	
OTHERS	●		●	●		●	●	Incorrect adjustment of throttle link	
							● ●	Insufficient cooling water flow, clogged or defective pump	
			●				● ●	Faulty thermostat	
				● ●			● ●	Cavitation or ventilation	
				● ●	●		● ●	Incorrect propeller selection	
			●	● ●	●		● ●	Damaged and bent propeller	
				● ●			● ●	Improper thrust rod position	
				● ●	●		● ●	Unbalanced load on boat	
				● ●	●		● ●	Transom too high or too low	
		●	●	●		●		Low compression	
			●					●	Carbon deposits in the combustion chamber
	Engine makes noise							Too much the valve clearance	

■ TOOL KIT AND SPARE PARTS

The following a list of the tools and spare parts provided with the motor.

Items		Quantity	Remark
Service tools	Tool bag	1	
	Pliers	1	
	Socket wrench	1	10 × 13 mm
	Socket wrench	1	16 mm
	Socket wrench handle	1	
	Screwdrivers	1	Cross-and straight-point
	Screwdriver handle	1	
Spare parts	Starter rope	1	Ø4-1,000 mm
	Spark plug	1	NGK : DCPR6E
	Shear pin	1	
	Split pin	1	

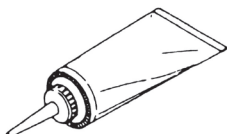
OPTIONAL ACCESSORIES



Propeller



Flushing attachment



Genuine gear oil (500ml)



Touch-up paint (300ml)



Genuine engine oil (1l)

PROPELLER TABLE

Use a genuine propeller.

A propeller must be selected so that the engine rpm measured at wide open throttle while cruising is within the recommended range.

2: 4,500 to 5,500 rpm

3.5: 5,000 to 6,000 rpm

Notes

Each size shows number of propeller blades × diameters × pitch.

	Propeller Mark	Propeller Size Diameter × pitch	Material	Remarks
Light boats Heavy boats	7	3 × 188 × 178mm 3 × 7.4 × 7.0inch	Plastics	Standard
	6	3 × 188 × 145mm 3 × 7.4 × 5.7inch	Plastics	Option
Aluminum			Option	
	4.5	3 × 188 × 110mm 3 × 7.4 × 4.3inch	Plastics	Option

MEMO

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MEMO

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OWNER'S MANUAL
MFS 2.5B
3.5B

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